



1. Simplify the following expressions using the properties of powers:

a) $2^7 : 2^3 =$ b) $x^5 \cdot x^3 \cdot x =$ c) $(x^5)^3 =$ d) $(2^3 \cdot 2^4 \cdot 2) : 2^5 =$ e) $2^3 \cdot 5^3 =$

a) $2^7 : 2^3 = 2^{7-3} = 2^4$

b) $x^5 \cdot x^3 \cdot x = x^{5+3+1} = x^9$

c) $(x^5)^3 = x^{5 \cdot 3} = x^{15}$

d) $(2^3 \cdot 2^4 \cdot 2) : 2^5 = 2^{3+4+1} : 2^5 = 2^8 : 2^5 = 2^{8-5} = 2^3$

e) $2^3 \cdot 5^3 = (2 \cdot 5)^3 = 10^3$

2. How many seconds does a century have? Write the result as a power of ten.

100 years \cdot 365 = 36500 days

36500 days \cdot 24 = 876000 hours

876000 hours \cdot 60 = 52 560 000 minutes

52 560 000 minutes \cdot 60 = 3 153 600 000 seconds

$315 \cdot 10^7$ seconds

3. Calculate the following step by step: $13 - 2 \cdot \sqrt{16} + [18 - 3 \cdot 2^2] : 3 =$

$13 - 2 \cdot \sqrt{16} + [18 - 3 \cdot 4] : 3 =$

$13 - 2 \cdot \sqrt{16} + [18 - 12] : 3 =$

$13 - 2 \cdot \sqrt{16} + 6 : 3 =$

$13 - 2 \cdot 4 + 6 : 3 =$

$13 - 8 + 2 = 7$



4. Calculate the prime factorization of 98, 140 and 350.

$$\begin{array}{r|l} 98 & 2 \\ 49 & 7 \\ 7 & 7 \\ 1 & \end{array}$$

$$\boxed{2 \cdot 7^2}$$

$$\begin{array}{r|l} 140 & 2 \\ 70 & 2 \\ 35 & 5 \\ 7 & 7 \\ 1 & \end{array}$$

$$\boxed{2^2 \cdot 5 \cdot 7}$$

$$\begin{array}{r|l} 350 & 2 \\ 175 & 5 \\ 35 & 5 \\ 7 & 7 \\ 1 & \end{array}$$

$$\boxed{2 \cdot 5^2 \cdot 7}$$

5. Work out the lcm and the HCF of 98, 140 and 350.
You can use the obtaining result from the exercise number 4.

$$\text{HCF} = 2 \cdot 7 = \underline{14}$$

$$\text{lcm} = 2^2 \cdot 5^2 \cdot 7^2 = 4 \cdot 25 \cdot 49 = 100 \cdot 49 = \underline{4900}$$

6. Calculate the letter that corresponds to the following identity card: 50877685 - ☐

$$\begin{array}{r} 50877685 \\ 048 \\ 27 \\ 47 \\ 0168 \\ 075 \\ 06 \end{array}$$

$$\begin{array}{r} 23 \\ \hline 2212073 \end{array}$$

0 T	1 R	2 W	3 A
4 G	5 M	6 Y	7 F
8 P	9 D	10 X	11 B
12 N	13 J	14 Z	15 S
16 Q	17 V	18 H	19 L
20 C	21 K	22 E	

$$\boxed{6 \rightarrow Y}$$

7. Change each letter by a digit to get a number divisible by the indicated number. Write as many numbers as possible.

a)	6a50	3
b)	55b	2
c)	2c42	6
d)	5dd	11
e)	7021e	9

- a) 6150; 6450; 6750
 b) 550; 552; 554; 556; 558
 c) 2142; 2442; 2742
 d) It isn't possible.
 e) 70218

8. In a public garden the gardener waters the grass every 6 days, the woodcutter cuts the branches and weeds every 21 days and the biologist fumigates every 18 days. They met in the garden the 1st January.

- a) How long does it take the gardener and the woodcutter to meet again?
 b) How long does it take three people to meet again?

a)
$$\begin{array}{r} 6 \overline{)2} \\ 3 \overline{)3} \\ 1 \\ 2-3 \end{array} \quad \begin{array}{r} 21 \overline{)3} \\ 7 \overline{)7} \\ 1 \\ 3-7 \end{array} \quad \text{l.c.m.}(6; 21) = 2 \cdot 3 \cdot 7 = 42 \text{ days}$$

b)
$$\begin{array}{r} 18 \overline{)2} \\ 9 \overline{)3} \\ 3 \overline{)3} \\ 1 \\ 2 \cdot 3^2 \end{array} \quad \text{l.c.m.}(6; 21; 18) = 2 \cdot 3^2 \cdot 7 = 126 \text{ days}$$

9. a) Write a power and explain the different parts that it has

3^5 ; 3 is the base and 5 is the exponent.

- b) What does HCF mean?

Highest common factor.

- c) How do you know if a number is divisible by 3 without doing the division?

The sum of the digits is divisible by 3.